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January 13, 2017

Arthur Burbank
Remediation Project Manager
Forest Service Intermountain Region
4350 Cliffs Drive
Pocatello, ID 83204

**Subject: Smoky Canyon Mine Remedial Investigation/Feasibility Study (RI/FS)
Biological Selenium Removal Treatment Technology Fluidized Bed Bioreactor Pilot Study**

Pilot Test Plan: Nutrient Optimization

*we offset C source -
No more send Art
an email.*

Dear Art,

The J.R. Simplot Company (Simplot) owns and operates the Smoky Canyon phosphate mine in southeastern Idaho. The Smoky Canyon Mine ("Mine" or "Site") is conducting Remedial Investigation (RI) and Feasibility Study (FS) for the removal of selenium from South Fork Sage Creek and Hoopes Springs Creek utilizing a fluidized bed reactor biological treatment system (FBR) developed by Frontier Water.

The FBR system requires a carbon source to provide an environment suitable for the removal of selenium. As called out in the *Pilot Study Work Plan and Sampling and Analysis Plan*, which is currently being followed for Phase I pilot operations, Micro C 4400 is currently used as the carbon source.

The *Draft Phase 2 Pilot Study Work Plan and Sampling and Analysis Plan* (which is currently being reviewed) allows for the optimization the pilot system by evaluating other carbon sources. Prior to commissioning of the Phase 2 pilot treatment, Simplot requests a test of the Frontier Water SeHawk Nutrient to evaluate its efficiency compared to the current Micro C nutrient. This nutrient if successful will reduce operation costs and storage requirements.

The SeHawk Nutrient is currently being successfully used with two other Frontier Water FBR units and is reported to produce favorable results. The safety data sheet (SDS) for the SeHawk Nutrient is attached. It would be very beneficial to conduct this evaluation as soon as possible and prior to startup of the Phase 2 system.

Thank you for your assistance and review of this request.

Please contact me or Jonathon Witt if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jeffrey Hamilton', with a long horizontal line extending to the right.

Jeffrey Hamilton
Environmental Engineer

Enclosures

cc: Submitted to the following in electronic (pdf) format via email, with the exception of paper copy to USFS, Pocatello only. Paper copies available upon request.

Sherri Stumbo - USDA Forest Service, 4350 South Cliffs Dr., Pocatello, ID 83204
Wayne Crowther - IDEQ, 444 Hospital Way, Suite 300, Pocatello, ID 83201
Brady Johnson - IDEQ, 1410 North Hilton, Boise, ID 83706
Colleen O'Hara-Epperly - BLM, 4350 South Cliffs Dr., Pocatello, ID 83204
Sandi Fisher - USFWS, 4425 Burley Dr., Suite A, Chubbuck, ID 83202
Matt Wilkening - USEPA, 950 West Bannock St., Suite 900, Boise, ID 83702
Kelly Wright - Shoshone-Bannock Tribes, P.O. Box 306, Fort Hall, ID 83203
Susan Hanson - (b) (6)
Rick McCormick - CH2M Hill, 322 East Front St., Suite 200, Boise, ID 83702
Alan Prouty - J.R. Simplot Company, P.O. Box 27, Boise, ID 83707
Burl Ackerman - J.R. Simplot Company, P.O. Box 27, Boise, ID 83707
Jonathan Witt - J.R. Simplot Company, P.O. Box 27, Boise, ID 83707
Chad Gentry - J.R. Simplot Company, P.O. Box 1270, Afton, WY 83110
Fred Charles - Formation Environmental, 2500 55th St., Boulder, CO 80301

SAFETY DATA SHEET (SDS)

SeHAWK™ Nutrient 2501

1. IDENTIFICATION

- **Product Name:** SeHAWK Nutrient 2501
- **Intended Use:** Electron donor for biological water treatment
- **Restrictions on Use:** Not intended for human consumption
- **Manufacturer/Supplier Information:**
 Frontier Water Systems
 3442 Sutherland St.
 San Diego, CA 92110
 619-326-9999
 www.frontierwater.com
- **Emergency Telephone Number:** (619) 326-9999

2. HAZARD(S) IDENTIFICATION

- **Hazard Classification:** This product does not meet the criteria for classification when reviewed according to the requirements of the Occupational Safety and Health Communication Standard, 29 CFR 1910.1200
- **Hazard Statements:**
 Exposure to mist may cause irritation of skin, eyes, throat and respiratory tract.
 Classification Category: Inhalation (Dust/Mist) – Category 4
 Target Organs: Lungs, Kidneys
- **Precautionary Statement:**
Prevention – Avoid breathing dust/ mist. Use with adequate ventilation.
Response – If inhaled, remove person to fresh air. Wash hands after handling.
Disposal – Dispose of waste and residues in accordance with local authority requirements.



3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS #	% by Weight
Glycerin; glycerol	56-81-5	66-70
Water	7732-18-5	21-28
Nonhazardous Salts	N/A	3-4
Urea	68966-60-9	2-3
Ammonium Polyphosphate	68333-79-9	1-2

4. FIRST AID MEASURES

- **General Advice:** Consult a physician if individual feels unwell after exposure. Present physician with this SDS.



- **Eyes:** Flush eyes for at least 15 minutes with clean water. Consult a physician immediately.
- **Skin:** Wash with water and soap. Remove contaminated clothing. Seek medical attention if irritation develops.
- **Inhalation:** Move to fresh air. Seek medical attention if breathing problems develop.
- **Ingestion:** Rinse mouth and consult a physician. Do not induce vomiting.

5. FIRE FIGHTING MEASURES

- **Suitable Extinguishing Agents:** CO₂, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Fire Fighting Equipment/ Precautions:** Wear self-contained breathing apparatus in case of large fires.
- **Specific Hazards:** Fermentation can yield yellow CO₂ with possible traces of ethanol or volatile fatty acids (e.g. acetic, propionic, lactic, or butyric) and if exposed to a spark or flame may result in an explosion. These conditions should be avoided. Decomposition products released in a fire should be considered as harmful.

6. ACCIDENTAL RELEASE MEASURES

- **Personal precautions, protective equipment and emergency procedures:** Ensure adequate ventilation. Spilled product may present slip hazard.
- **Methods for containment and cleaning up:** Stop source of spill. Create diversionary structures to minimize extent of release. Recover useable product. Absorb/wash down remaining spill and dispose of at an approved facility.
- **Materials for Contamination and Cleanup:** Use absorbent pads/materials to soak up small spills. A vacuum pump may be needed to recover larger spills.

7. HANDLING AND STORAGE

- **Precautions for safe handling:** Use with adequate ventilation. Wear appropriate personal protective equipment. Avoid contact with eyes. Material can ferment spontaneously using oxygen, possibly creating a hazardous atmosphere. If entrance to storage tank is required by personnel, Confined Space Entry standards must be employed and atmosphere testing must be performed prior to tank entry.
- **Conditions for safe storage:** Store in a well-ventilated area or container. Store in suitable, labelled containers. Keep containers closed while not in use. Store below 120°F.
- **Incompatibilities:** None known.

8. EXPOSURE CONTROL/ PERSONAL PROTECTION

- **Occupational Exposure Limits:** N/A
- **Appropriate Engineering Controls:** Store below 120°F and provide general ventilation.
- **Eye/Face Protection:** If contact is likely, safety glasses with side shields are recommended.
- **Skin Protection:** Use suitable gloves and protective clothing.
- **Respiratory Protection:** In case of insufficient ventilation, wear suitable respiratory equipment.



- **Thermal Hazards:** Wear appropriate thermal protective clothing when necessary.
- **General Hygiene Considerations:** Always observe good personal hygiene measures, such as hand washing after handling the materials and before eating/ drinking. Wash work clothing and personal protective equipment to remove contaminants.

9. PHYSICAL/ CHEMICAL PROPERTIES

- **Physical State:** Viscous, syrupy liquid
- **Color:** Light to dark brown
- **Odor:** Sweet
- **Odor Threshold:** No data
- **pH:** 5.5-6.0
- **Melting Point:** No data
- **Freezing Point:** <0° F
- **Boiling Point:** >212° F
- **Flash Point:** No data
- **Evaporation Rate:** No data
- **Flammability:** No data
- **Upper/Lower Flammability or Explosive Limits:** No data
- **Vapor Pressure:** No data
- **Vapor Density:** No data
- **Relative Density:** 1.23 g/mL (10.3 lbs/gal)
- **Solubility:** Soluble in water
- **Partition Coefficient:** No data
- **Auto-ignition Temperature:** No data
- **Decomposition Temperature:** >120° F
- **Viscosity:** 0 – 100,000 cps at 70° F

10. STABILITY AND REACTIVITY

- **Reactivity:** Reacts with concentrated nitric acid. Avoid contact with oxidizing agents.
- **Chemical Stability:** Product stable under normal conditions of use, storage, and transport.
- **Possibility of Hazardous Reactions:** Ferments when diluted with water. If diluted below 50% fermentation may occur with large expansion in volume (addition of propionic acid or sulfuric acid to decrease pH <4.5 will prevent fermentation). Care should be taken when adding sulfuric acid to prevent charring. Acid must be added



with strong agitation at point of contact.

- **Conditions to Avoid:** Avoid heat, open flames, and storage in unventilated tanks or containers.
- **Hazardous Decomposition Products:** Carbon monoxide, alcohol, or fatty acid vapors.

11. TOXICOLOGICAL INFORMATION

- **Ingestion:** Ingestion may result in nausea, vomiting and diarrhea. Aspiration into the lungs can cause damage and inflammation.
- **Skin Contact:** Contact may cause mild skin irritation. Symptoms include redness, itching, burning, or dermatitis.
- **Inhalation:** Breathing of mist/ vapors may be harmful and cause irritation of throat and lungs.
- **Eye Contact:** Contact with eyes may cause mild irritation. Symptoms include watering, redness, and swelling.
- **Target Organs:** Lungs, Kidneys.
- **Prolonged Exposure:** Symptoms include nausea, headache, vomiting.

12. TOXICOLOGICAL INFORMATION

- **Ecotoxicity:** Results in high Biological Oxygen Demand (BOD) and potential oxygen depletion of aquatic systems. Glycerin 96 hr LC50: 51,000 – 57,000 mg/L (Rainbow Trout), > 5000 mg/L (Goldfish)
- **Persistence and Biodegradability:** No data
- **Bioaccumulative Potential:** No data
- **Mobility in Soil:** No data
- **Other Adverse Effects:** No data

13. DISPOSAL CONSIDERATIONS

Dispose of product at an approved facility, as applicable, in compliance with local environmental standards and regulations.

14. TRANSPORTATION INFORMATION

- **US Domestic DOT:** Not regulated
- **Shipping Name:** Glycerin; Glycerol
- **IMDG:** Not dangerous goods
- **IATA:** Not dangerous goods



- **Marine pollutant:** No

15. REGULATORY INFORMATION

- **Toxic Substance Control Act:** The components of this product are listed on the TSCA Inventory of Existing Chemical Substances.

Section 302 (EHS) TPQ – Not applicable

Section 304 (EHS) TPQ – Phosphoric Acid (5000 #'s), Sodium Hydroxide (1000 #'s)

- **SARA Section 311/312 Hazard Categories:**

Acute – No

Chronic – No

Physical – No

Pressure Hazard – No

Fire Hazard – No

- **SARA Section 313:** This product may contain trace amounts of a chemical that is subject to reporting requirements of SARA

Methanol CAS # 67-56-1. Typical % Weight in Product 0.0-0.10%

- **CERLA:** This product may contain trace amounts of a chemical that is subject to reporting requirements of CERLA

Methanol RQ # 5,000. Typical % Weight in Product 0.0-0.10%

- **Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3):** None

- **Stage Right to Know Regulations:**

Chemical Name: Glycerin

California – Proposition 65: Not applicable

Massachusetts Right to Know: Glycerin, Phosphoric Acid, Sodium Hydroxide

Minnesota Hazardous Substances List: Glycerin Mist

New Jersey Right to Know: Phosphoric Acid, Sodium Hydroxide

Pennsylvania Right to Know: Glycerin, Phosphoric Acid, Sodium Hydroxide

Rhode Island Right to Know: Glycerin, Sodium Hydroxide

16. ADDITIONAL INFORMATION

Revision Status: 11/08/16 (Replaces 8/17/2016)

The information in this document is obtained from supplier information and publicly available sources and is believed to be accurate and represents the best information currently available to Frontier Water Systems. All



data and numbers represented are typical. These may vary dependent of origin, product process, supplier or producer.

The content and format of this SDS is in accordance with the Federal Occupational Health and Safety Administration (OSHA) and United Nations Global Harmonized Standard for Classification of Chemicals (GHS). The information provided in this SDS is provided for health, safety, and environmental assessment by a professional user. This information does not warrant suitability for the buyer's uses. Any recommendations given here should be made by a qualified person familiar with the user's particular circumstances.

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